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Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,*

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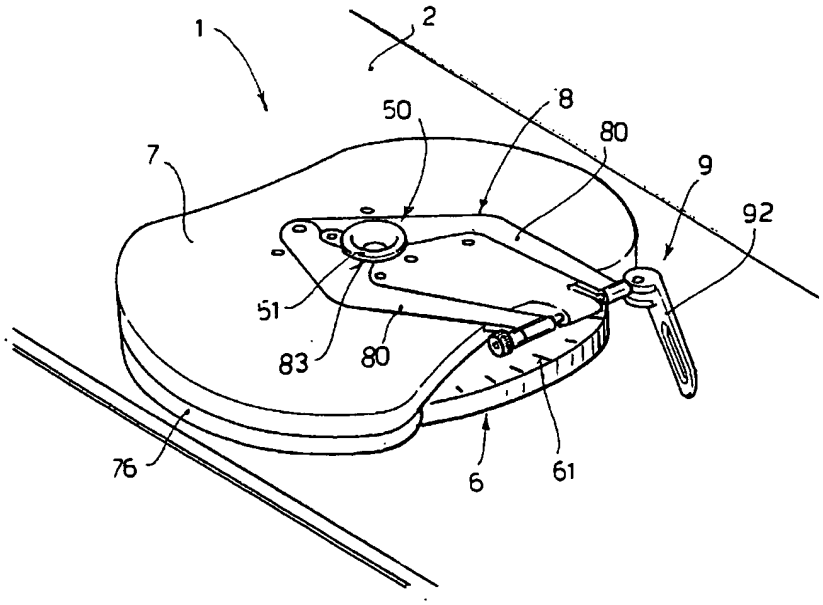
(54) Title: SNOWBOARD BINDING SUPPORT AND SNOWBOARD BINDING



(57) Abstract: A snowboard binding support (1) comprises a supporting plate (7) interposed between the upper surface of the board (2) and the bottom surface of the base of the binding, so as to allow the base of the binding to be raised with respect to the board, said support comprising adjustment means, able to allow adjustment in translation and/or rotation of the supporting plate (7) with respect to the board (2) and operating means (9) that can be operated by the user to enable/disable said adjustment.

WO 02/062433 A1

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SNOWBOARD BINDING SUPPORT AND SNOWBOARD BINDING

DESCRIPTION

The present invention refers to a snowboard binding support and a snowboard binding.

As is known, a snowboard comprises a board, generally of wood and fibreglass-reinforced plastic on which are fitted two bindings able to receive respective soft or rigid snow boots worn by the user.

Depending upon the snowboarding style and the user's requirements, the positioning and orientation of the bindings on the board are extremely important.

For this purpose a plurality of holes able to receive screw means for fixing the bindings in the desired position are formed on the board.

Moreover, to allow angular adjustment, some types of bindings have a crown wheel that engages with a toothed ring nut formed in the binding. Holes (from three to five) are formed in the crown wheel to receive the screw means for fixing the binding to the board.

These types of bindings according to the prior art present drawbacks due above all to the difficulty and awkwardness in adjusting the position on the board.

In fact, when the user wants to change the position of a binding on the board, that is to say he wants to move the binding toward the tip or toward the tail of the board, he must loosen four screws, move the binding and then retighten the screws to fix the binding in the new position on the board.

The same applies when the user wants to rotate the binding with respect to the board. In this case, in fact, he must loosen the screws, disengage the crown wheel from the toothed ring nut and turn these elements with respect to each other, then re-engage the crown wheel with the ring nut and fix the screws to the board.

It is obvious that both the operations of translation and of rotation of the binding with respect to the board are somewhat complex, waste too much time, and also require the use of appropriate tools, such as screwdrivers or spanners to loosen/tighten the screws.

Furthermore, the fact that the bindings according to the prior art are mounted directly on the board leads to other drawbacks.

In fact, on snowboards with traditional bindings, the user keeps the centre of gravity low and therefore has difficulty in switching from one edge of the snowboard to the other when making turns. Furthermore, the weight of the user is not evenly distributed on the board, with a resulting lack of stability.

The object of the present invention is to eliminate the drawbacks of the prior art by providing a binding support and a binding for snowboards that allow the operations for adjusting the position of the binding on the board to be simplified.

Another object of the present invention is to provide a binding support and a binding for snowboards that are practical, versatile and simple to use.

These objects are achieved, according to the invention, with the characteristics listed in appended independent claim 1.

Advantageous embodiments of the invention are apparent from the dependent claims.

The snowboard binding support according to the invention has a track mounted integrally on the board. Slidably mounted on the track is a slide that supports a crown wheel on which a tang with a collar is mounted. The track and the slide can both have a toothed profile.

A plate that has a toothed seat able to receive the crown wheel and a central hole from which the tang of the crown wheel exits is mounted on the slide. Mounted on the plate is a jaw which, when it grips, engages the collar of the tang keeping the slide raised so that the crown wheel engages in the toothed seat, blocking rotation of the plate, and the toothed profile of the slide engages in the toothed profile of the track, preventing translation of the slide on the track.

The jaw is operated by a user-operated lever. When the user operates the lever and releases the grip of the jaw, the crown wheel disengages from the toothed seat and therefore the plate can turn with respect to the slide and at the same time the toothed profile of the slide disengages from the toothed profile of the track and therefore the slide can translate integrally with the plate with respect to the track.

A snowboard binding of the traditional type can be mounted on the supporting plate. Alternatively, the supporting plate can be configured as a real binding, providing two side walls and a rear wall to surround the side walls and the heel of the snowboarding boot. Strips with fixing hooks to firmly block the boot are applied to the walls.

The advantages of the binding support and the snowboard binding according to the invention are obvious.

In fact this type of support, with a single movement operating a lever or other mechanism, allows two adjustments of the binding simultaneously, in translation and in rotation. These adjustments are performed without having to remove the boots from the binding and without the use of tools to loosen the screws.

The support according to the invention raises the user's centre of gravity making the shift from one edge to another during use immediate and reactive.

Furthermore, thanks to the support according to the invention, the heel and toe of the user's boot remain raised, considerably reducing the problems that are encountered in tilting of the snowboard on the snow.

Furthermore, the supporting plate is advantageously wider than the base of the bindings, therefore it allows the entire weight of the user to be distributed directly on the blades of the board, both in the front part and in the rear, with the result of having greater stability during snowboarding.

Furthermore, by interposing shims, the supporting plate can be mounted on the board with a certain tilt, thus acting as canting. Rubber shims which cushion impact and reduce vibration of the board can be positioned beneath the supporting plate.

Further characteristics of the invention will be made clearer by the detailed description that follows, referring to a purely exemplary and therefore non-limiting embodiment thereof, illustrated in the appended drawings, in which:

Figure 1 is an exploded perspective view illustrating a snowboard shown broken away and some elements forming part of the support according to the invention;

Figure 1A is an exploded perspective view illustrating a variant embodiment of the track and slide assembly of the support according to the invention;

Figure 2 is an exploded perspective view of other elements forming part of the support according to the invention;

Figure 3 is a plan view from beneath of the supporting plate illustrated in Figure 2;

Figure 4 is an overall perspective view of the support according to the invention, mounted on a board shown broken away.

The support according to the invention, designated as a whole by reference numeral 1 and shown in Figure 4 assembled on a snowboard, designated by reference numeral 2, will be described with the aid of the figures.

As shown in Figure 1, the support 1 comprises a track 3 consisting of a plate that has a lowered central portion 30 and two side portions 31 raised with respect to the central portion 30.

In the central portion 30 there are holes 32 able to receive screw means to fix the track 3 on the upper surface of the board 2. In particular, four pairs of single holes 32 and two pairs of double holes 32' are provided. The double hole 32' consists of two adjacent single holes. Each pair of holes has a first hole near the first raised side portion 31 and a second hole near the second raised side portion. The holes 32, 32' are substantially equidistant from each other.

At the ends of the central portion 30 are two abutment surfaces 34 protruding upward to act as stops.

The side portions 31 of the track 3 have a serrated profile 33 in their bottom surface.

A slide 4 is slidably mounted on the track 3. The slide 4 consists of a rectangular plate 42 with side flaps 40 folded downward. In this manner the side flaps 40 assume a substantially C-shaped cross section with a gap 41 able to receive the side portions 31 of the track 3.

The bottom part of the side flaps 40 has an upward facing serrated profile 43, matching the serrated profile 33 of the side portions 31 of the track 3. In this manner, when the slide 4 is positioned on the track 3 with the side portions 31 of the track inside the gap 41 of the side portions of the slide, the slide can slide on the track. On the other hand, when the slide 4 is raised upward, the serrated profile 43 of the side portions of the slide meshes with the serrated profile 33 of the side portions of the track and thus translation of the slide 4 is blocked.

A crown wheel 44 is mounted above the slide 4, in a central position. A substantially frusto-conical shaped tang 50 with an upwardly increasing diameter is mounted above the crown wheel 44. The tang 50 ends in an outwardly protruding collar 51.

Two springs 45 are provided on the slide 4 alongside the crown wheel 44. Each spring 45 has a fixed part 46 integral with the slide 4 and a free part 47. Between the fixed part 46 and the free part 47 is a central upward-facing bellows part 48.

With reference to Figure 1A, a variant embodiment of the track 3 and slide 4 assembly is shown. In this case the track 3, instead of having the serrated profile 33 has on the upper surface of the side portions 31 a plurality of seats 35 having a substantially hemispherical concave shape.

Accordingly, the slide 4 does not have the serrated profile 43 and the flat springs 45. Instead, on the rectangular plate 42 of the slide 4, near the four corners, four circular through holes 52 able to allow the passage of four spheres 53 which fit exactly into the hemispherical seats 35 are provided.

In this manner, a portion of the spherical cap fits into the respective seat 35 and another portion of the spherical cap protrudes upward from the rectangular plate 42 of the slide 4.

A graduated indicator 6, shown in Figure 2, is positioned on the table 2, around the slide 4 which is mounted on the track 3. The graduated indicator 6 consists of a disc-shaped plate with a central hole 60 that is rectangular in shape in order to receive the slide 4 and the track 3. A graduated scale 61 that goes from 0 to 360° is provided on the circumferential surface of the graduated indicator 6.

As shown in Figure 2, a supporting plate 7 having a substantially elliptical shape with a width substantially equal to or slightly smaller than the width of the board 2 is positioned on the graduated indicator 6.

The supporting plate 7 has a central hole 71 through which the frusto-conical tang 50 can pass so that the supporting plate 7 is free to rotate around the tang 50.

As shown in Figure 3, the supporting plate 7 has in its bottom surface, around the central hole 71, a doughnut-shaped recessed seat 77, defined by an outer toothed profile 78. The seat 77 has an outer diameter substantially equal to the diameter of the crown wheel 44 and the profile 78 of the seat 77 meshes with the toothed profile of the crown wheel 44.

The supporting plate 7 further has quarter-moon shaped side spacers or shims 76, which laterally surround the graduated indicator 6 to come into contact with the board 2.

When the plate 7 is positioned on the slide 4, the central parts 48 of the springs 45 come into contact with the bottom surface of the plate 7 and keep it raised with respect to the slide 4, so that the crown wheel 44 does not mesh with the toothed profile 78 of the toothed seat 77 of the supporting plate; thus the plate 7 is free to turn around the tang 50. In this situation, moreover, the weight of the supporting plate 7 pushes the slide 4 downward, therefore the serrated profile 43 of the slide does not engage with the serrated profile 33 of the track 3 and consequently the slide 4 can translate above the track 3 conveying with it the supporting plate 7. In the case of the variant of Figure 1A, the spheres 53 are free to rotate in their seats 35 of the track 52 of the slide, thus the slide 4 can translate along the track 3.

Returning to Figure 2, provided on the upper surface of the supporting plate 7 is a substantially U-shaped recessed seat 70, in which the minimum of the U comprises the hole 71. After the hole 71, in the end of the U-shaped seat 70, a pivot hole 72 is provided,

whilst other holes 75 able to receive fixing screws for fixing of a binding are provided on the plate 7.

The plate 7 has a protruding part 73 disposed along the bisector of the U-shaped seat in a position opposite the minimum of the U. The protruding part 73 has a through hole 74 parallel to the plane of the plate 7.

A substantially nutcracker-shaped jaw device 8 is received in the seat 70 of the supporting plate 7. The jaw device 8 comprises two levers 80 pivoted at their ends by means of a pin 81 which engages in the pin seat 72 of the seat 70.

To minimize the thickness, the jaw device can have two separate levers, hinged by means of their respective pins in respective holes formed in the U-shaped seat 70.

Each lever 80 has an outer profile with an obtuse angle. Each lever 80 has a semicircular inner profile 83 near the end at which it is pivoted. Each lever 80 has in the opposite end to that in which it is pivoted a cylindrical block with a through hole 82 having an axis at right angles to the axis of the pin 81 of the levers.

When the jaw device 8 is housed in the seat 70 of the supporting plate, the semicircular profiles 83 of the levers 8 surround the tang 50 and remain beneath the collar 51 of the tang 50. The holes 82 of the cylindrical end block of the levers 80 remain substantially coaxial with the hole 74 in the end part 73 of the supporting plate 7.

An operating device 9 is provided for the jaw device 8. The operating device 9 has a stem 90 which is inserted in the holes 82 of the levers 80 of the jaw device and in the hole 74 of the end 73 of the supporting plate.

A locking nut 91 is fixed at one end of the stem 90 and the other end of the stem 90 is hinged, by means of a pin 93, with its axis at right angles to the axis of the stem 90, to a cam 94 integral with an operating lever 92 that can be operated by the user.

Operation of the support 1 for snowboard bindings according to the invention is described below with reference to Figure 4.

When the user wants to lock the supporting plate 7, he manually operates the operating lever 92 moving it in the locking position, in which the cam 94 of the operating lever 92 pushes the end block of the lever 80 of the jaw device and therefore brings the two ends of the levers 80 together. Consequently the semicircular profiles 83 of the levers 80 act to grip the conical surface of the tang 50 causing raising thereof.

As a result raising of the slide 4 occurs against the action of the springs 45. Thus the toothed profile 43 of the slide 4 engages with the toothed profile 33 of the track 3 blocking translation of the slide 4 on the track 3 and the toothed profile of the crown wheel 44 engages with the toothed profile 78 of the seat 77 of the supporting plate 7, blocking rotation of the supporting plate 7 around the tang 50. Clearly in the variant of Figure 1A the spheres 53 are pressed by the supporting plate 7 inside the spherical seats 35, blocking rotation of the spheres and thus translation of the slide 4 along the track 3.

When the user has to adjust the position of the supporting plate 7, he operates the operating lever 92 in the nonlocking position. The cam 94 of the operating device 9 thus acts on the end of the cylindrical block of the lever 8 of the jaw device, releasing the grip of the jaw device on the tang 50. Consequently, through the action of the springs 45 the supporting plate 7 is raised with respect to the slide 4, therefore the crown wheel 44 disengages from the toothed seat 77 thus allowing the possibility of rotation of the supporting plate 7 around the tang 50.

Moreover, the weight of the supporting plate 7 pushes the slide 4 downward and therefore the serrated profile 43 of the slide 4 disengages from the serrated profile 33 of the track 3, thereby allowing translation of the slide 4 on the track 3 and thus also translation of the supporting plate 7 which remains integral with the slide as it translates. Clearly in the variant of Figure 1A, in this situation, the spheres 53 are no longer pressed by the supporting plate 7 and thus are free to rotate in their seats, allowing translation of the slide 4 with respect to the track 3.

The present embodiment of the invention has been described with reference to a support 1 on which snowboard bindings of known types can be fitted. However, the invention also extends to a type of snowboard binding which, in place of a traditional base, has a support like that described previously.

In fact, the supporting plate 7 can also have two side walls and a heel piece. Strips with locking hooks to block the user's boot are fixed to the side walls and the heel spoiler is connected to the heel piece.

Numerous variations and modifications of detail within the reach of a person skilled in the art can be made to the present invention without departing form the scope of the invention set forth by the appended claims.

CLAIMS

1. A snowboard binding support (1) characterized in that it comprises a supporting plate (7) interposed between the upper surface of the board (2) and the bottom surface of the base of the binding, so as to allow the base of the binding to be raised with respect to the board.

2. A support according to claim 1, characterized in that it comprises adjustment means such as to allow adjustment of the supporting plate (7) in translation and/or rotation with respect to the board (2) and operating means (9) that can be operated by the user to enable/disable said adjustment means.

3. A support according to claim 2, characterized in that said translation adjustment means comprise:
- a track (3) mounted integrally on the board (2),
- a slide (4) slidingly mounted on said track and integral in translation with said supporting plate (7), and
- translation blocking means that can be operated by said operating means (9).

4. A support according to claim 3, characterized in that said translation blocking means comprise a serrated profile (33) provided on said track (3) and a matching serrated profile (43) provided on said slide (4).

5. A support according to claim 3, characterized in that said translation locking means comprise a plurality of substantially hemispherical concave seats (35), provided on said track, and a plurality of spheres (53) disposed in holes (52) in said slide (4) to engage in said concave seats (35) of said track (3).

6. A support according to any one of claims 2 to 5, characterized in that said means of adjustment in rotation comprise:
- a cylindrical tang (50) integral with said board (2) or with said slide (4) and engaging in a hole (71) of said supporting plate (7) so that the supporting plate can rotate with respect to said tang, and
- rotation locking means that can be operated by said operating means (9).

7. A support according to claim 6, characterized in that said rotation locking means comprise a crown wheel (44), integral with said slide (4), which can be engaged in a toothed seat (77) formed in the bottom surface of said supporting plate (7).

8. A support according to any one of claims 2 to 7, characterized in that said operating means (9) act on said supporting plate (7) and/or on said slide (4) to bring the supporting plate (7) into a locked position in which adjustment thereof is not permitted and an unlocked position in which adjustment in translation and in rotation is permitted.

9. A support according to claim 8, characterized in that said operating means (9) comprise a lever (92) that can be operated by the user and acts on a jaw device (8) able to grip the neck of said tang (50) to lower said supporting plate (7) or raise said slide (4), so as to allow locking of said supporting plate (7) and/or of said slide (4).

10 A support according to claim 9, characterized in that said jaw device (8) comprises two levers (80) pivoted in said supporting plate (7).

11. A support according to any one of claims 3 to 10, characterized in that spring means (45) are interposed between said slide (4) and said plate (7) to distance said supporting plate (7) from said slide (4).

12. A support according to any one of the preceding claims, characterized in that a graduated indicator (6) integral with the board is placed between said board (2) and said supporting plate (7), to indicate the adjustment in rotation of said supporting plate (7) with respect to the board (2).

13. A support according to any one of the preceding claims, characterized in that shims (76) of soft material are interposed between the board (2) and the supporting plate (7) to dampen the impact and vibrations of the board.

14. A support according to any one of the preceding claims, characterized in that said supporting plate (7) is mounted on the board in a tilted position so as to act as canting for the bindings.

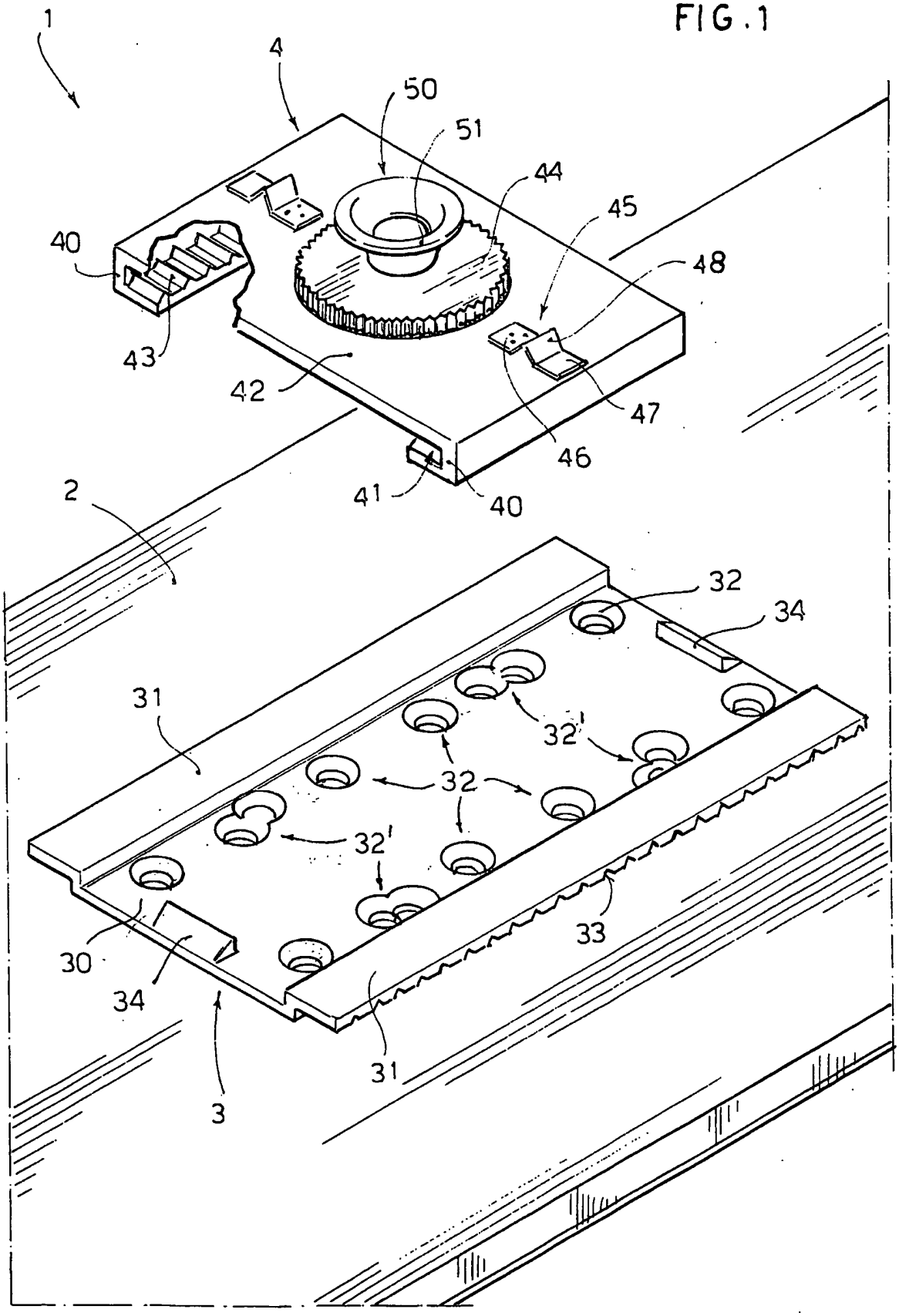
15. A support according to any one of the preceding claims, characterized in that said supporting pate (7) is configured as a snowboard binding.

16. A snowboard binding characterized in that the base of said binding comprises a support (1) according to any one of the preceding claims.

17. A snowboard characterized in that it comprises a support according to any one of claims 1 to 15.

18. A snowboard characterized in that it comprises a binding according to claim 16.

FIG.1



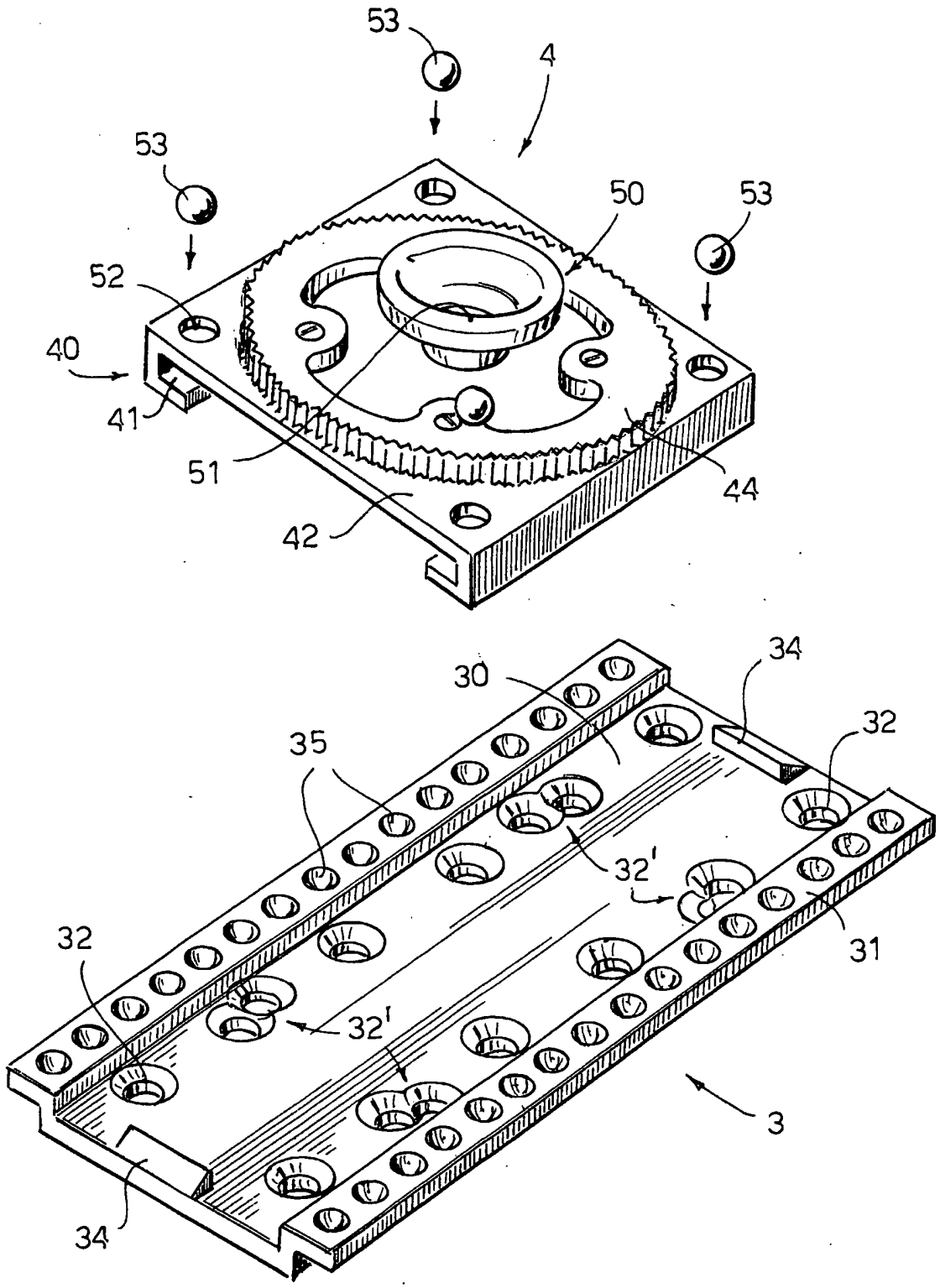


FIG. 1A

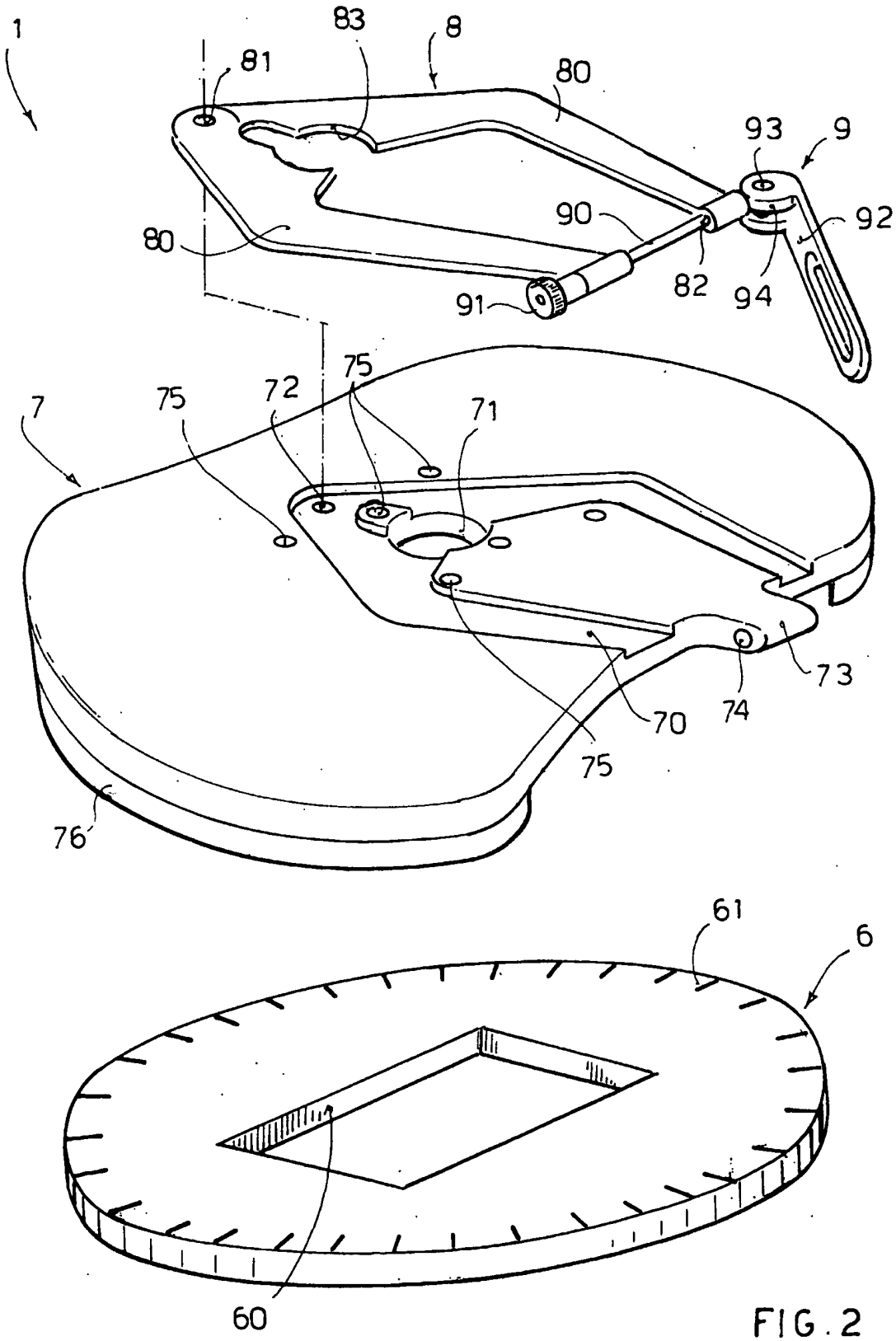


FIG. 2

FIG.3

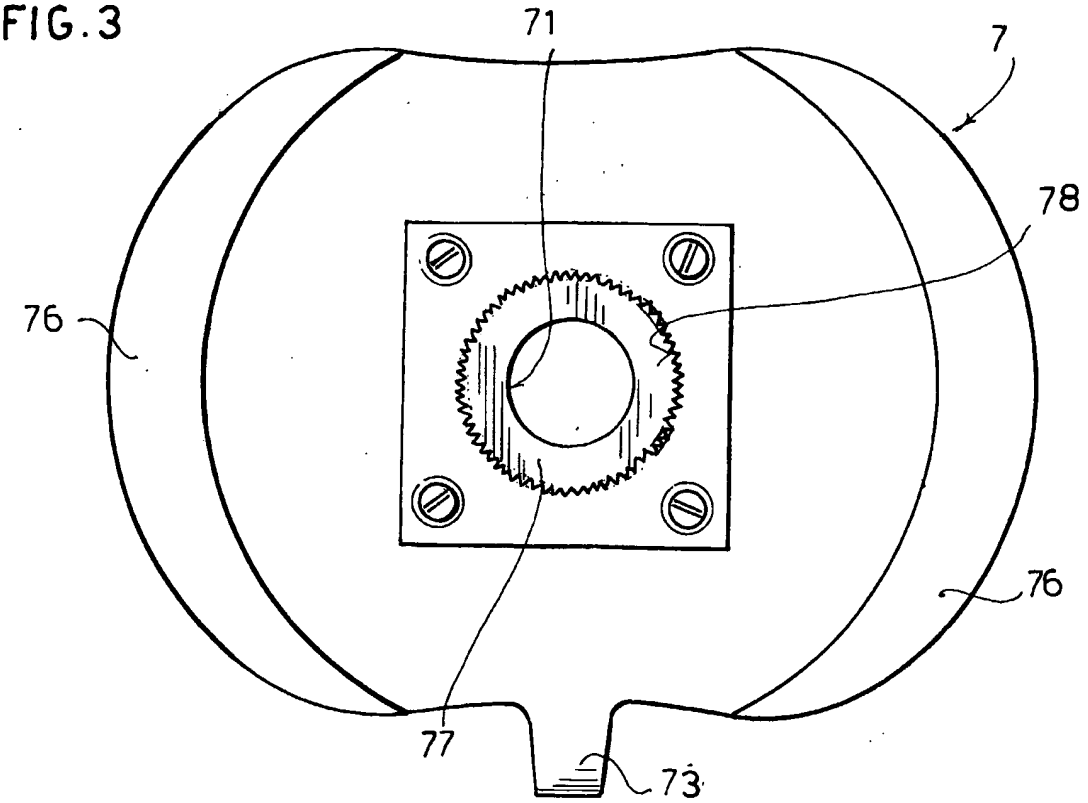
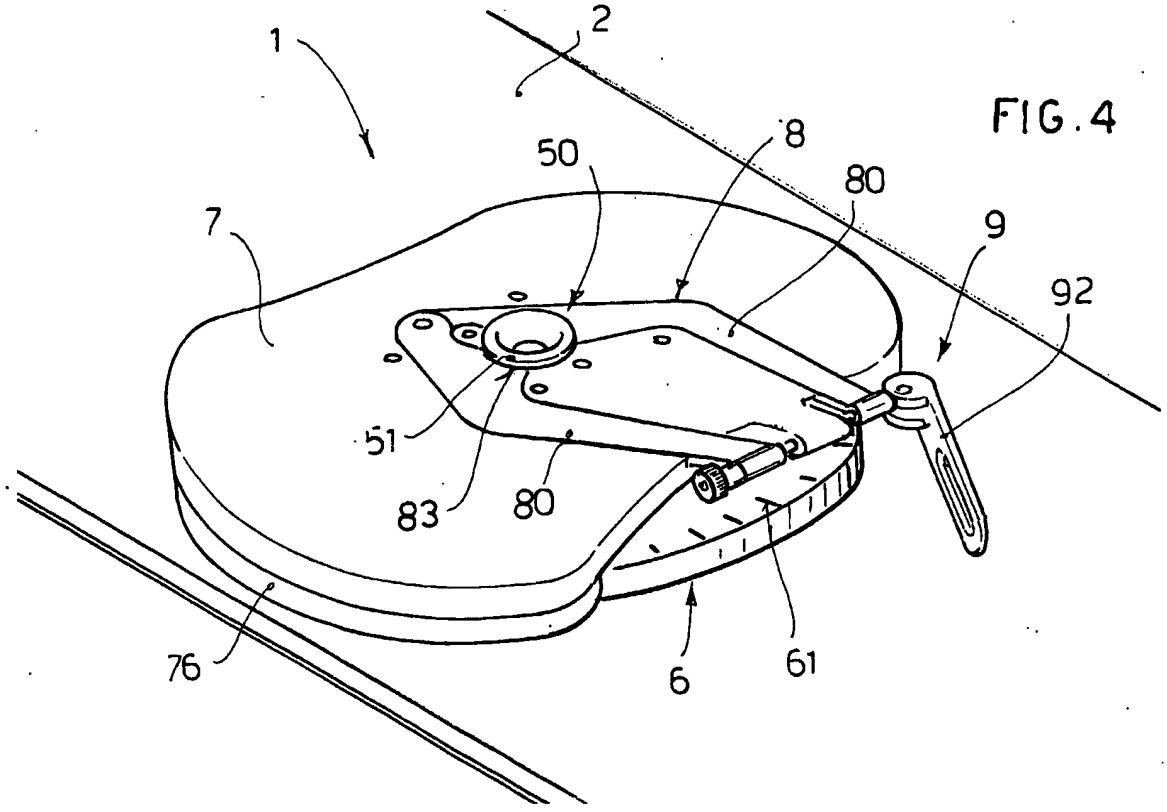


FIG.4



INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 02/00635

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A63C9/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A63C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 647 148 A (MEISELMAN) 15 July 1997 (1997-07-15) column 3, paragraph 1; figure 5	1,2, 16-18
A	EP 0 891 793 A (ELLIM CORP. LTD) 20 January 1999 (1999-01-20) page 1 column 5, paragraph 4; figures 7,8	1,2,13
A	US 5 947 508 A (GRAF ET AL) 7 September 1999 (1999-09-07) page 1 column 3, paragraph 2	1,2
A	US 5 035 443 A (KINCHELOE) 30 July 1991 (1991-07-30) page 1	1,2

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
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Name and mailing address of the ISA	Authorized officer
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
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